The prestressing effect was applied through an initial strain, an option offered by this element. As a result of an initial parametric investigation, it was found that the maximum initial strain numerically possible was 0.0045 in/in, instead of the 0.0052 in/in considered by Hassan and Rizkalla (2004).

For the behavior of the concrete elements, the material characteristics predefined in the "Concrete Non-Metal Plasticity" model were used to generate a multilinear isotropic model (MISO). The MISO curve was generated as is presented in Kachlakev et al. (2001). The modulus of elasticity E and the tensile strength f_r were derived from the nominal value of the ultimate compressive strength f'_c. During the analysis, same convergence problem was faced due to low shear transfer coefficient β_t. After a few preliminary analyses, a 0.25 value was considered to be used in further investigations. This value is similar to other researchers' findings. See Table 3.1 for a comparison of the material characteristics for the two concrete structural members used in the analyses. For the reinforcements (GFRP and prestressing tendons), a perfectly elasto-plastic bilinear isotropic (BISO) model was considered, as presented in Table 3.2.

Table 3.1 Concrete Properties

Material property	Deck	Girder
Modulus of elasticity E [ksi]	3,370	4,030
Compressive strength f'_c [psi]	3,500	5,000
Tensile (rupture) strength f_r [psi]	444	530
Shear transfer coefficient β_t	0.25	0.25
Poisson's ratio ν	0.2	0.2

Table 3.2. Reinforcing Material Properties

Material Property	Smeared GFRP rods	Steel Prestressing tendons
Modulus of elasticity E [ksi]	5900	29000
Ultimate tensile strength F_u [ksi]	72	270
Poisson's ratio ν	0.3	0.3